Alaska Monitoring & Assessment Program (AKMAP)
2013 Arctic Coastal Plain NPR-A Lakes Survey Design

Contact:
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Description of Sample Design

Target population: Natural and man-made freshwater lakes, reservoirs, and ponds greater than one hectare in surface area and with a maximum depth greater than one meter.

Sample Frame: This data set was produced in ARCGIS V 10.1 using waterbody and twelve digit hydrologic unit boundary data for the state of Alaska, accessed from the United States Geological Survey's (USGS) National Hydrography Dataset.

The study area is defined as the section of Arctic Coastal Plain (ACP) bounded by the National Petroleum Reserve of Alaska. Areas inside of hydrologic unit corridors (HUCs) sampled during the 2011 AKMAP Wetlands Survey located just outside the boundary of the ACP were also included in this survey.

Survey Design: Approximately 35,195 lakes were identified as candidates for the National Lakes Assessment. Coordinates produced for the 2011 AKMAP Wetlands Survey using a Generalized Random Tessellation Stratified (GRTS) survey design were used to locate a subset of 30 random survey lakes to represent this population.

Survey lakes were visually evaluated using imagery from the Statewide Digital Mapping Initiative's 2010 SPOT satellite orthophotos as accessed through Alaska Mapped web map service. Lakes directly connected with oceans or estuaries were excluded and replaced with the next candidate nearest the random coordinate within its respective HUC.

Lakes identified for sampling were assigned ten points along the shoreline for the purpose of conducting habitat surveys. Point locations were assigned at random and spaced equidistant from one another along the perimeter of the shore.

Multi-density categories: None

Stratification: Yes

Panels: Two panels: Random and targeted.

Expected sample size: Expected sample size includes 30 GRTS sites and 10 target sites.

Over sample: Potential alternate lakes (250 in total) were identified in the same manner should field visits prove that a lake does not meet the minimum criteria required for sampling. An additional 10 "target" lakes were chosen based on their proximity to target wetlands sampled during the 2011 AKMAP Wetlands Survey.

Site Use: Within Alaska, the base design has 30 sites. Sites are listed in SiteID order and must be used in that order. Due to Alaska's remoteness and logistical concerns sites will not be sampled in SiteID order. Sites are samples in proximity to one another and in the event a base site is dropped, the closest alternate will be attempted. As an example, if 30 are to be sampled and the 11th site is determined not able to be sampled in the field, then the closest alternate to the 11th site will be attempted.

Sample Frame Summary

The 40 survey lakes total 1,914 ha in surface area and represent 0.25% of the 752,595 ha candidate lakes comprise within the study area.

Site Selection Summary

Number of sites in sample

Panel			
	Random	Base	30
		Alternate	200
	Target	Base	10
		Alternate	50
Sum			290

Description of Sample Design Output:

The dbf file for the shapefile ("NLA_Lakes_final_071913") has the following variable definitions:

Variable Name	Description
SiteID	Unique site identification (character)
x	x-coordinate from map projection (see below)
y	y-coordinate from map projection (see below)
mdcaty	Multi-density categories used for unequal probability selection
weight	Weight (in km), inverse of inclusion probability, to be used in statistical analyses
stratum	Strata used in the survey design
panel	Identifies base sample by panel name and Oversample by OverSamp
EvalStatus	Site evaluation decision for site: TS: target and sampled, LD: landowner denied access, etc (see below)
EvalReason	Site evaluation text commment
auxiliary variables	Remaining columns are from the sample frame provided

Projection and Geographic Information

Projected Coordinate System: NAD_1983_Alaska_Albers
Projection: Albers
False_Easting: 0.000000
False_Northing: 0.000000
Central_Meridian: -154.000000
Standard_Parallel_1: 55.000000
Standard_Parallel_2: 65.000000
Latitude_Of_Origin: 50.000000
Linear Unit: Meter (1.000000)

Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Prime Meridian: Greenwich
Angular Unit: Degree

Evaluation Process

The survey design weights that are given in the design file assume that the survey design is implemented as designed. Typically, users prefer to replace sites that cannot be sampled with other sites to achieve the sample size planned. The site replacement process is described above. When sites are replaced, the survey design weights are no longer correct and must be adjusted. The weight adjustment requires knowing what happened to each site in the base design and the over sample sites. EvalStatus is initially set to "NotEval" to indicate that the site has yet to be evaluated for sampling. When a site is evaluated for sampling, then the EvalStatus for the site must be changed. Recommended codes are:

EvalStatus Code	Name	Meaning
TS	Target Sampled	site is a member of the target population and was sampled
LD	Landowner Denial	landowner denied access to the site
PB	Physical Barrier	physical barrier prevented access to the site
NT	Non-Target	site is not a member of the target population
NN	Not Needed	site is a member of the over sample and was not evaluated for sampling
Other codes		Many times useful to have other codes. For example, rather than use NT, may use specific codes indicating why the site was non-target.

Statistical Analysis

Any statistical analysis of data must incorporate information about the monitoring survey design. In particular, when estimates of characteristics for the entire target population are computed, the statistical analysis must account for any stratification or unequal probability selection in the design. Procedures for doing this are available from the Aquatic Resource

Monitoring web page given in the bibliography. A statistical analysis library of functions is available from the web page to do common population estimates in the statistical software environment R.

For further information, contact

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